EXECUTIVE SUMMARY

This final environmental impact statement (FEIS) describes and analyzes the impacts of a program the U.S. Department of the Interior, Bureau of Land Management (BLM), proposes to implement to treat vegetation on public lands in 13 Western States—Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oklahoma, eastern Oregon, South Dakota, Utah, Washington, and Wyoming. The impacts of BLM's program to manage vegetation in California and western Oregon have been covered in separate EIS documents and therefore will not be analyzed here. The impacts of BLM's program to manage noxious weeds in the states of Washington, Oregon, Idaho, Montana and Wyoming have been covered in a separate EIS document. See Appendix I-2 (1 thru 3) taken from the USDI-BLM, 1985 "Northwest Area Noxious Weed Control Program, final environmental impact statement." The list of noxious weed species that are being treated or might be treated is also in that document. The program is required to fulfill BLM's legal mandate, particularly the Federal Land Policy and Management Act of 1976, to manage public lands and their resources.

The vegetation treatment methods described in this final EIS include manual, mechanical, biological, prescribed burning, and chemical. Manual methods involve using hand or power tools; mechanical methods, heavy equipment, such as bulldozers; biological methods, plant-eating organisms, such as goats and insects; prescribed burning, controlled fire; and chemical methods (herbicides) to treat vegetation. Treatments would be made on selected sites to cut back or eliminate some part of the existing plant community or to eliminate selected plants. Treating vegetation is necessary to develop or restore a desired plant community, create biological diversity, increase forage or cover for animals, protect buildings and other facilities, manage fuels to reduce wildfire hazard, manage vegetation community structure, rejuvenate decadent vegetation, enhance forage/browse quality, or remove noxious weeds or poisonous plants. The areas that would be treated include rangelands, public domain forest lands, oil and gas sites, rights-of-way, and recreation and cultural sites.

In accordance with the National Environmental Policy Act (NEPA), this programmatic final EIS identifies impacts on the human environment by analyzing potential impacts of each vegetation treatment method and then, of vegetation treatment program alternatives, including the proposed program, that combine several methods.

PUBLIC PARTICIPATION

A primary consideration in developing the scope of this EIS was to determine which issues concern the public. When the decision was made to complete this vegetation treatment EIS, a public participation and coordination plan was developed to solicit public comments. A Notice of Intent was published in July 1988 describing the proposed program and soliciting comments in writing and through a number of public scoping meetings. Public participation is continuing as this FEIS undergoes public review and comment.

Many members of the public supported the proposed treatment program and recommended certain methods for specific target vegetation. Others were concerned about possible health effects or environmental damage from using herbicides and prescribed fire and about adverse effects from altering ecological systems in general. Because of the concern about using chemical herbicides and prescribed fire, particularly in terms of human health risk, those methods are given the greatest emphasis in the analysis. Separate detailed risk assessments, done on herbicides and on prescribed fire effects, are included as appendixes to this EIS. Emphasis is also given to potential program impacts on important vegetation communities of the West.

AFFECTED ENVIRONMENT

Methods and alternative programs are analyzed for potential impacts on 14 resource categories of the 13 Western States: vegetation, climate and air quality, geology and topography, soils, aquatic resources, fish and wildlife, cultural resources, recreation and visual resources, livestock, wild horses and burros, special status species, wilderness and special areas, human health and safety, and social and economic resources. Because impacts on many of these resources are likely to vary with the dominant type of vegetation on and near the treated sites, they are discussed where they apply in each of eight vegetation analysis regions of the Western States: sagebrush, desert shrub, southwestern shrub-steppe, chaparral-mountain shrub, pinyon-juniper, plains grassland, mountain/plateau grassland, and coniferous/deciduous forest.

EIS ORGANIZATION

Chapter 1 of this final EIS discusses the purpose and need for the proposed action, describes the methods of vegetation treatment and alternative programs, and summarizes the impacts of the programs. Appendixes C and E (Section E-2) give more detail about the treatment methods. Chapter 2 describes the 14 categories of resources in the EIS area that may be affected by the alternative programs; Chapter 3 discusses the impacts of the methods (Chapter 3, Section 1) and alternative programs (Chapter 3, Section 2). Chapter 4 describes the public's participation in the preparation of the EIS and Chapter 5 lists the EIS preparers and reviewers. Appendixes D and E present the detailed risk assessments on prescribed burning and herbicides, respectively.

ALTERNATIVES

Based on the concerns identified in scoping, the EIS analyzes the impacts of five alternative vegetation treatment programs (Table ES-1) that combine the various methods of treating vegetation. Alternative 1, the proposed action, which allows use of all available treatment methods—manual, mechanical, biological, prescribed burning, and chemical—to treat up to 372,000 acres of public lands annually, is the preferred alternative.

Alternatives 2, 3, and 4, respectively, limit herbicides to ground application, eliminate herbicide use, and prohibit prescribed fire. The acreages proposed for treatment under Alternatives 2, 3, and 4 are less than those under the preferred alternative because the terrain or other factors on some sites limit treatment to certain methods. Alternative 5, the No Action Alternative, continues BLM's existing level of vegetation management.

Because the proposed program covers such a wide and diverse area of the country, the FEIS does not analyze impacts on any specific site or group of sites. Instead, the FEIS provides an overview of the possible impacts of the different vegetation treatment methods and their combined use in the alternative programs, based on broad regional characteristics of the 13 Western States. Site-specific analyses tiered to this EIS will be done at the local level.

Implementing the selected treatment program would involve coordination with State and county agencies, public land lessees, and adjoining landowners to accomplish a vegetation treatment and to ensure that adequate safety measures are followed.

Table ES-1

Estimated Annual Average Acreage (In Thousands) by Treatment Method for Each BLM Vegetation Treatment Alternative

Method	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Manual	14.1	14.2	13.9	13.7	12.8
Mechanical	58.1	71.2	74.2	69.2	41.9
Biological	60.2	60.1	60.2	60.2	57.6
Prescribed Burning	97.8	132.3	136.4	0	92.7
Chemical	141.5	45.2	0	175.5	37.5
Total Acres	**371.7**	**323.0**	**284.7**	**318.6**	**242.5**

Note: Several factors may cause a reduction or increase in acreage in any given year, such as available funds, other workloads, revised land use planning, Threatened and Endangered species conflicts, cultural and visual resources and management concerns.

Alternative 1: The Proposed Action

Under the proposed action, all vegetation treatment methods would be available for use, to treat an estimated average 372,000 acres of public lands annually in the 13 States. This alternative is preferred because it gives BLM the greatest flexibility in specifying site treatments using the most effective and economical method available. The estimated average of 372,000 acres to be treated under the proposed action conforms to land use plan objectives and budget capabilities on public lands. Chemicals and prescribed burning would be used on most (64 percent) of the proposed treated acreage in this program. All safety requirements and project design features would be followed in accordance with BLM policy and Environmental Protection Agency (EPA) registration restrictions, as they would under all alternatives.

Alternative 2: No Aerial Application of Herbicides

This alternative would treat fewer acres (estimated average 323,000) because it would eliminate aerial herbicide application because of concerns about public health and potential damage to aquatic ecosystems from offsite chemical drift. Ground methods of herbicide application would be used for 45,000 acres. Manual and mechanical methods would be used on 14,000 and 71,000 acres, respectively. The acreage for biological treatment would decrease slightly from Alternative 1 at 60,000 acres, while prescribed burning would increase to 132,000 acres.

Alternative 3: No Use of Herbicides

Because of public health and worker safety concerns and a general concern about pesticides in the environment, no herbicides would be used under this alternative. This alternative would have the highest acreages specified for mechanical (74,000 acres) and prescribed burning (136,000 acres) treatments of any of the alternatives, but the overall treated acreage would be lower than Alternatives 1 or 2, with an estimated average of 285,000 acres treated.

Alternative 4: No Use of Prescribed Burning

Under this alternative, prescribed burning would not be permitted because of concerns about the effects of smoke on human health and the effects of burning on ecological systems. To compensate in part for the loss of fire as a tool, this alternative would have the highest annual average acreage (175,000) treated chemically, with biological being 60,000 acres. Herbicides would be applied aerially on 141,000 acres, and ground application methods would be used on 35,000 acres. Manual methods would be used to treat 14,000 acres, and mechanical methods would be used to treat 69,000 acres. The average estimated treated acreage would be 318,000 acres.

Alternative 5: No Action (Continue Current Management)

Under this alternative BLM would continue using the existing vegetation treatment program. An estimated average of 243,000 acres would be treated annually using manual, mechanical, biological, prescribed burning, and chemical methods. Approximately 62 percent would continue to be treated using prescribed burning and biological methods.

METHODS OF ANALYSIS

Impacts in this final EIS were evaluated by an interdisciplinary team of BLM and contract scientists that included experts in vegetation ecology in the Western States and in the human health and environmental effects of pesticides. Available studies on the effects of different treatment methods on western plant communities were researched and summarized and conclusions about program impacts were drawn from that body of scientific literature. The analysis of effects in the EIS is, in general, qualitative, but where impacts could be quantified, such as in the areas of human health and impacts of herbicides on wildlife, a quantitative risk assessment was done.

The herbicide risk assessment evaluated human and wildlife exposures and potential risks from using 19 different herbicides and two additives. However, after impact and risk assessment analyses, 17 are proposed for use in the vegetation treatment program. BLM has reexamined the risk assessment and examined additional data for amitrole. BLM has determined that amitrole is no longer considered for proposed use in this document. Amitrole will be deleted in the Record of Decision. Since drafting this document, producers are no longer manufacturing dalapon formulations registered for proposed use. Therefore, dalapon is no longer considered for use. However, information on all 19 herbicides is included throughout the document.

Human health effects evaluated included general systemic effects, effects on reproduction, cancer, heritable mutations, and effects on the nervous and immune systems. For the estimation of worker and public exposures from aerial and ground applications, both a typical and maximum likely rate of herbicide application was used for each type of program area application (for example, rangeland, right-of-way). The actual rate of herbicide application on a particular site is expected to be lower than the maximum rate used in the analysis and will depend on target vegetation species, time of year, application equipment, and herbicide formulation.

Herbicide formulations (Appendix M) may also contain one or more inert ingredients that may present health risks. BLM has determined that no formulation would be used in the program if it contains inert ingredients on EPA's List 1 (inerts of toxicological concern) or List 2 (inerts of high priority for testing), with the exception of petroleum distillate carriers, kerosene and diesel oil (their risks are evaluated in this analysis). However, if there is no product available that does not contain inert ingredients on EPA 1 or 2, then an herbicide product that does contain inert ingredients identified on EPA List 1 or 2 may be considered for use, with the understanding that the risk will be evaluated before treatment.

Environmental Consequences

Vegetation

Vegetation treatments would benefit as well as adversely impact both target and nontarget vegetation within the EIS area. Where individual plant species are the target, such as in noxious weed control, some injury or loss of nontarget vegetation may occur from all methods, particularly from herbicide use. Changes in species composition, plant community structure, species diversity, and productivity will result on sites where all vegetation is treated. Some species will be enhanced by treatment; others will be suppressed on the treated site. Treatment method and number of acres treated would determine the degree of vegetation impact. Positive impacts, the principal program objectives, would include wildlife habitat improvement, fuel hazard reduction, selection of desired timber species, and reduction or elimination of populations of noxious weeds.

Manual treatment methods should have no adverse impacts on nontarget vegetation for two reasons: 1) they are the most selective for target species and 2) they have limited application in the program because they are labor intensive and ineffective in controlling established creeping perennials, so they would not be used for large-scale rangeland improvement projects or for prescribed burning pretreatment.

Mechanical treatments generally kill woody species that do not have below-ground growing points. Root-sprouting shrub species will replace damaged canopies, and growth may actually be stimulated by mechanical treatments unless such species are treated by a method which severs them below the root crown. Herbaceous species are damaged by treatment methods that cause the most soil disturbance, in contrast to methods which cause more superficial soil disturbance and result in minimal damage. Plowing or root-cutting would generally require subsequent revegetation.

Normally mechanical treatment methods would affect woody plants more than herbaceous plants because root-sprouting woody species cannot quickly replace above-ground structure, whereas herbaceous species can replace their canopies annually. However during periods of drought, resprouting woody species such as rabbitbrushes, mesquite, and acacias can replace above-ground structures more rapidly than herbaceous species because they may have more extensive root systems to tap deep soil moisture.

Biological treatments with sheep, cattle, and goats would have slight impacts on a localized basis from feeding on nontarget vegetation to the extent that nontargets are interspersed with target species on a grazed site. Insect and pathogen treatments should have no impacts on nontarget plants because these techniques are species specific.

Prescribed burning could help prevent wildfires by removing fuel ladders and excess litter accumulations. Prescribed burning might decrease total plant productivity on a site but shift species composition from dominance by woody species to dominance by herbaceous species and stimulate new growth of certain woody species. Fire would significantly affect plant competition by changing the numbers and species of existing plants, altering site conditions, and requiring plants to reestablish on a site. Perennial plants with existing root systems usually have an advantage over plants that must develop from seed. There would be short-term reductions in productivity of many species but longer term desired results on target species. A particular plant species may or may not be desired on a treatment site, depending on land use objectives; therefore, the determination would be made on a site-specific basis according to individual goals of the management plan.

The impacts of chemical treatments would vary depending on how closely related the target and nontarget species are, the selectivity of the herbicide,

and the application rate. More sensitive annual plants would be affected to a greater degree than perennials, especially if killed before producing seed, although the ability of plants to maintain viable seeds in the soil for several years should reduce the susceptibility of a plant species to herbicides.

Adverse impacts discussed above for all vegetation treatment methods could apply under Alternative 1. The overall positive impacts would be to achieve desired vegetation communities on treated rangeland and forestland sites, create stratified age structure dynamics in some shrublands for wildlife habitat improvement, reduce hazardous fuel buildup, reclaim certain areas to native perennial vegetation, reduce populations and spread of noxious weeds, remove vegetation that was a potential hazard to recreationists, and maintain safe conditions in rights-of-ways and oil and gas facilities. Specific areas of some shrub-dominated rangeland communities would have higher production of herbaceous vegetation mixed with shrubs. Alternative 1 offers the greatest degree of flexibility of any alternative for general vegetation management and for control of noxious weeds and poisonous plants.

Under Alternative 2, elimination of aerial chemical treatments would reduce the potential for offsite impacts on nontarget plants. Desired vegetation communities prescribed in land use or activity plans would not be achieved in some areas where treatment would be foregone because other treatments could not be substituted. Managerial ability to select the most appropriate and cost-effective treatment method for rangeland situations would be reduced under this alternative. Most treatments for riparian areas, recreation areas, oil and gas facilities, and most rights-of-way would not be affected by this alternative. Noxious weeds would continue to be controlled in most infestation situations. More prescribed fire would be used than under the Proposed Action. Because aerial chemical treatment would not be available, target areas for treatment of shrub and brush species that do not carry fire might not be treated at all. Noxious weeds would be controlled, but overall management effectiveness would be less than under Alternative 1.

With no use of herbicides under Alternative 3, impacts discussed above for chemical methods would not occur. Desired vegetation communities prescribed in land use plans or activity plans would not be achieved in some areas where treatment would be foregone because other treatments could not be substituted. Managerial ability to select the most appropriate and cost-effective treatment in nearly all situations would be limited under this alternative. Most noxious weeds would not be controlled, and safety hazards from proliferation of undesired plants could develop on on oil and gas facilities, rights-of-way, and recreation areas because of ineffective treatments by other methods. Reclamation efforts in saltcedar and cheatgrass communities would be far less effective relative to the Proposed Action.

More acreage would be treated with chemicals under Alternative 4 than under any other alternative. Therefore, the impacts of chemical methods would apply to the greatest degree here, but the impacts of prescribed burning would not. The likelihood of catastrophic wildfire increases without the use of prescribed fire. Vegetation management objectives in land use or activity plans would not be met in specific areas. Managerial ability to select the most appropriate and cost-effective treatment method for rangeland situations would be limited under this alternative. There will be long-term undesirable effects from no use of prescribed fire in nearly all vegetation analysis regions, where fire was historically an ecological factor.

Fewer acres would be treated under Alternative 5 than under any other alternative. Vegetation management objectives in land use or activity plans would not be met in specific areas. Although all treatment methods would be available under this alternative and the impacts discussed under all methods would apply here, program use of herbicides would be more limited than under Alternative 1, and fewer acres would be treated with herbicides than under any other alternative except Alternative 3. Controlling noxious weeds and poisonous plants would not be as effective as under Alternative 1.

Climate and Air Quality

The most significant impact to air quality would be moderate, short-term increases in dust and exhaust generated by manual and mechanical treatment methods, smoke and particulates from prescribed burns, and chemical drift from herbicide applications. Air quality standards would not be violated. The aircraft and equipment used in vegetation treatments would create temporary, localized noise. Alternative 3 would cause the highest overall impacts to air quality because it involves the highest acreage of burning. Alternative 4 should have the fewest impacts because no acreage would be burned (although smoke impacts from wildfires would increase).

Geology and Topography

Because treatments are likely to affect only the soil surface on relatively small geographic areas compared to the extent of geologic and major topographic features, none of the alternatives should impact these resource elements.

On a smaller scale, local topography could be affected to some extent where significant vegetation removal from a treated site leads to wind or water erosion. Proper management practices should prevent this from occurring on most sites.

Soils

The impacts of manual and biological treatment methods on soils would be negligible. Chemical treatments would not impact soils directly but could indirectly affect soil microorganisms. Mechanical and prescribed burning treatment methods have the greatest potential to impact soils. Alternative 3 has the greatest potential to impact soils because it has the highest combined acreage of mechanical and burning treatments. Alternative 4 would have the fewest impacts on soils because no prescribed burning would be used and relatively few acres would be treated mechanically.

Aquatic Resources

Manual and biological treatment methods would have a negligible impact on aquatic resources provided that Standard Operating Procedures (SOPs) are followed. Mechanical and prescribed burning treatments would increase short-term erosion. Sedimentation from these treatments could be minimized using SOPs and Best Management Practices (BMPs). Herbicide treatments could cause drift onto surface water, however, the SOPs would minimize this occurrence. Contamination potential exists for ground water from herbicides if SOPs are not followed. The use of the screening procedure given in the SOP should eliminate any ground water contamination from herbicides. Alternative 3 could cause the greatest impacts because it has the highest combined acreage of mechanical and prescribed burning treatments. Alternative 4 should have the least impacts because no prescribed burning would be used and relatively few acres would be treated by mechanical methods. More acres are treated by herbicides than under any other alternative, thus increasing the potential for ground and surface water contamination because of accidents.

Fish and Wildlife

Fisheries and riparian resources are not likely to be significantly impacted under any of the treatment methods or alternatives, if suggested mitigation is incorporated into the individual treatment proposals. Impacts to wildlife from forage and habitat reductions would likely be temporary and localized, except when permanent vegetation type-conversion is planned.

There will be a permanent or long-term change in the wildlife community using these type-conversion areas. Alternative 1 would have the most potential beneficial impacts on wildlife because the best and/or least impacting method for treating a specific habitat would be available for use. Alternative 1 also has the greatest potential for adverse impacts. Appropriate mitigation and control of aerial spraying are necessary to avoid adverse impacts, as are application of proper project designs on site-specific treatments. The most acres of current habitat will be disturbed.

Alternative 2 would have impacts similar to Alternative 1, except the potential adverse impacts from aerial spraying are eliminated, and competition between noxious weeds and native forage plants would be greater with the less effective control of the noxious weeds. Few projects directly beneficial to wildlife would be foregone. Under Alternative 3 the potential adverse effects of herbicides on fish and other wildlife would be eliminated. Impacts from prescribed burning would largely be substituted for impacts from herbicides. Fewer acres of beneficial projects, available in Alternative 1, would be accomplished in this alternative. Fewer acres of current habitat would be disturbed than in Alternatives 1, 2, and 4. The least acres of noxious weeds would be treated, and an associated loss of native forage plants would occur. There would be no effective method for treating saltcedar-invaded areas to restore native riparian areas.

In Alternative 4, with no use of prescribed fire, one of the most practical and cost effective methods of wildlife habitat improvement is eliminated. Excess plant and timber residue, as a result of other treatment methods, would not be effectively removed and movement of some wildlife species would be inhibited. The most acres of aerial and total herbicide application would occur in this alternative, with the highest potential for adverse impacts to wildlife. Also, many acres of herbicide application would be less effective because it was not considered the preferred method of control.

Alternative 5 would have fewer impacts from treatments because fewer overall acres would be treated under this alternative. No potential adverse impacts from herbicide application would occur in some states where herbicide use is restricted. The fewest acres of current wildlife habitat would be disturbed in this alternative, and the least acres of beneficial habitat improvements accomplished.

Cultural Resources

Some of the proposed vegetation treatments, particularly mechanical, could impact cultural resources and traditional lifeways; however, the exact probability of damaging cultural resources

and lifeways cannot be determined at the level of analysis possible in a study of this scope. No proposed treatment project will be authorized until specific impacts to cultural resources and lifeways are considered. In keeping with BLM policy, proposed treatments will be modified to avoid adverse effects on significant cultural resources and lifeways. Alternative 5 has the lowest probability of impact because this alternative has the fewest acres treated with manual and mechanical methods. Alternative 3 could have the greatest impacts because more mechanical treatments would be used than under any other alternative.

Recreation and Visual Resources

All program alternatives would result in short-term scenic degradation. Recreation areas infested with noxious weeds and poisonous plants would benefit by reducing potential visitor exposure to harmful vegetation species. Alternative 3 could have the greatest adverse impacts because without herbicides some noxious weeds would be difficult to control. Alternative 1 could have the most beneficial impact overall because it would enable use of the best treatment method for a particular site.

Livestock

Livestock should not be directly affected by any of the treatment methods, and the adverse impacts on livestock forage would be short term. Alternative 1 would have the most beneficial impacts for livestock because forage production could be maintained or improved, and toxic plants could be controlled by the best suited methods. Without using herbicides (Alternative 3), noxious weeds and poisonous plants would be more difficult to control and therefore could adversely affect livestock.

Wild Horses and Burros

Wild horses and burros should not be adversely affected under any of the alternatives. In fact, they should benefit from increased forage quantity and quality, receiving the most benefit from Alternative 1.

Special Status Species

The possible impacts to special status plant and animal species are potentially the same as those discussed under vegetation and fish and wildlife. However, analyses completed before any site is treated would identify any special status species at the site, and appropriate measures would be taken to protect that species. Therefore, the impacts from treatment methods and alternatives to special status species should be negligible. In addition, treatments such as removal of exotic species should enhance habitats for special status species.

Wilderness and Special Areas

Wilderness and special areas are not likely to be adversely affected by the treatment methods under any of the alternatives. Undesirable vegetation in wilderness areas and wilderness study areas may be controlled, allowing native plants in the natural ecosystem to better compete. Site-specific impacts to special areas will be addressed further in district or resource area analyses that precede vegetation treatment actions.

Human Health and Safety

Manual methods of vegetation treatment should not affect members of the public because they would not handle any of the equipment involved. Workers using hand tools could receive minor injuries or major injuries from using power tools.

Mechanical methods should not affect members of the public. Workers would be at risk of the same types of injuries that agricultural or construction workers might incur when using tractors and other heavy equipment.

Neither members of the public nor workers would be affected by biological methods of vegetation treatment.

Sensitive members of the public and some workers may experience minor ill effects, such as eye and lung irritation, for the smoke of prescribed fires. In addition, workers may suffer burns when igniting or managing prescribed fires, although BLM guidance policies and required protective clothing minimize this risk.

None of the proposed herbicide uses pose a health risk to members of the public from typical exposures in any program area. Exposures to workers involved in herbicide application were conservatively calculated to avoid underestimation. Workers may be at risk from some herbicides if they receive these exposures. However, mitigation, such as protective clothing and strict adherence to BLM herbicide application guidance, should reduce the actual exposures workers receive to levels that do not pose any significant risks. Some workers on rangeland are at risk of systemic effects from atrazine,

2,4-D, dalapon, dicamba, tebuthiuron, triclopyr, and diesel oil; reproductive effects from atrazine, 2,4-D, dicamba, glyphosate, and tebuthiuron; and a theoretical cancer risk from atrazine and 2,4-D.

Under typical conditions of public-domain forest land herbicide applications, members of the public are not at risk from systemic effects. No adverse reproductive effects are expected from any herbicide use. Workers in this scenario are at risk of systemic effects from using 2,4-D and triclopyr; reproductive effects from atrazine and tebuthiuron; and increased cancer risks from amitrole, atrazine, 2,4-D, and simazine.

Under typical conditions for oil and gas treatment sites, members of the public are not at risk from systemic, reproductive, or carcinogenic effects. Some workers on these sites are at systemic risk from atrazine, bromacil, 2,4-D, diuron, simazine, and triclopyr; reproductive risk from atrazine, diuron, simazine, and tebuthiuron; and cancer risk from atrazine, bromacil, 2,4-D, and simazine.

On rights-of-way in the typical case, members of the public are not at risk from systemic effects. Some workers are at risk of systemic effects from atrazine, bromacil, 2,4-D, diuron, mefluidide, metsulfuron methyl, simazine, and triclopyr; reproductive effects from atrazine, diuron, simazine, and tebuthiuron; and carcinogenic effects from atrazine, bromacil, 2,4-D, and simazine.

Members of the public would have no significant systemic, reproductive, or carcinogenic risks from herbicide treatments of recreation and cultural sites. Under typical conditions, some workers may be at risk of systemic effects from using atrazine, 2,4-D, and triclopyr; reproductive effects from atrazine and tebuthiuron; and a theoretical cancer probability from atrazine, 2,4-D, and simazine.

The risks estimated in the risk assessment for this EIS are those that would be expected under Alternative 1. Alternative 2 would limit the risk of public exposure to the herbicides, as well as eliminate risks to workers on an aerial application team. Alternative 3 would eliminate all herbicide risks to members of the public and workers. Alternative 4 would eliminate risks from smoke inhalation and potential fire injuries to workers. Alternative 5 would reduce the risks from all methods, as compared to Alternative 1 on a population-wide basis, because fewer acres would be treated.

Social and Economic Resources

Vegetation treatment costs would vary by alternative. Employment opportunities would have a minimal increase, regardless of the treatment program implemented. Untreated acreage damages public and private resources, causing economic losses and decreased aesthetic value. Alternative 1 has the lowest treatment cost per acre than Alternatives 2, 3, or 4. Alternative 5 has the lowest cost per acre of any alternative, but it also offers no new employment opportunities. Alternative 3 offers the most employment opportunities and no use of herbicides is more socially desirable to some populations.

MEASURES TO MINIMIZE IMPACTS

BLM will employ the standard operating procedures and mitigation described in Chapter 1 to minimize adverse impacts on the environment in the EIS area. BLM manuals and handbooks provide standards and provisions for resource improvements and treatments. Mitigation was developed based on the analysis in this EIS.

The standard procedure for vegetation treatment on a particular site begins with a review of objectives stated in the land use plan covering that site. A site field survey is conducted to determine the presence and proximity of resources that may be at risk from the treatments, including human habitations, aquatic resources, special status species, and cultural resources.

The kinds of mitigation, both project design features and special mitigation, concerning herbicide use, in particular, that would be used to limit risk to these resources may include suspending aerial herbicide applications whenever weather conditions may cause offsite drift or runoff, limiting use of herbicides that pose human health risks, and providing buffer zones along riparian areas.

Prescribed fire would not be used when fuel moisture conditions are too low or when the burn might become too hot from a structure or resource that is too close to the site to ensure safety. Prescribed burning activities must comply with BLM Manual requirements to minimize air quality impacts from smoke. Under all Alternatives, Federal, state and local air quality regulations would not be violated.